

ISSUANCE DATE AND SIGNATURE PAGE

U.S. ENVIRONMENTAL PROTECTION AGENCY
UNDERGROUND INJECTION CONTROL PERMIT: CLASS I
Permit Number AK-11001-A

In compliance with provisions of the Safe Drinking Water Act (SDWA), as amended, (42 U.S.C. 300f-300j-9), and attendant regulations incorporated by the U.S. Environmental Protection Agency (EPA) under Title 40 of the Code of Federal Regulations, ARCO Alaska, Inc. (permittee) is authorized to inject non-hazardous industrial waste through three Class I injection wells (Northwest Well, Southwest Well, and Southeast Well) located at NW 1/4, Sec. 11, T.10N, R.14E, Alaska, into the Sagavanirktok Formation, in accordance with conditions set forth herein. Injection of hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA), as amended, (42 USC 6901) or radioactive wastes are not authorized under this permit. Injection shall not commence until the operator has received written authorization from the EPA Director, Region 10 Office of Water, to inject.

All references to Title 40 of the Code of Federal Regulations are to all regulations that are in effect on the date that this permit is issued.

This permit shall become effective on _____, 1999, in accordance with 40 CFR 124.15.

This permit and the authorization to inject shall expire at midnight, _____, 2009, unless terminated.

Signed this _____ day of _____, 1999

Randall F. Smith, Director
Office of Water
U.S. Environmental Protection Agency
Region 10

TABLE OF CONTENTS

ISSUANCE DATE AND SIGNATURE PAGE	1
GENERAL PERMIT CONDITIONS	4
EFFECT OF PERMIT	4
PERMIT ACTIONS	4
SEVERABILITY	4
CONFIDENTIALITY	5
GENERAL DUTIES AND REQUIREMENTS	5
Duty to Comply	5
Penalties for Violations of Permit Conditions	5
Duty to Reapply	5
Need to Halt or Reduce Activity Not a Defense	5
Duty to Mitigate	5
Proper Operation and Maintenance	6
Duty to Provide Information	6
Inspection and Entry	6
Records	6
Reporting Requirements	8
Anticipated Noncompliance	8
Twenty-Four Hour Reporting	8
Other Noncompliance	8
Reporting Corrections	8
Signatory Requirements	8
PLUGGING AND ABANDONMENT	9
Notice of Plugging and Abandonment	9
Plugging and Abandonment Report	9
Cessation Limitation	9
Cost Estimate for Plugging and Abandonment	10
FINANCIAL RESPONSIBILITY	10
WELL SPECIFIC CONDITIONS	11

CONSTRUCTION	11
Casing and Cementing	11
Tubing and Packer Specifications	11
New Wells in the Area of Review	11
CORRECTIVE ACTION	11
WELL OPERATION	11
Prior to Commencing Injection	11
Mechanical Integrity	12
Injection Intervals	13
Injection Pressure and Rate Limitations	13
Annulus Pressure	13
Injection Fluid Limitation	13
MONITORING	14
Monitoring Requirements	14
Continuous Monitoring Devices	14
Alarms and Operational Modifications	14
REPORTING REQUIREMENTS	14
Quarterly Reports	14
Report Certification	14
REPORTING FORMS	16

PART I
GENERAL PERMIT CONDITIONS

A. EFFECT OF PERMIT

The permittee is allowed to engage in underground injection in accordance with the conditions of this permit. The underground injection activity, otherwise authorized by this permit, shall not allow the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR Part 141 or may otherwise adversely affect the health of persons or the environment. Compliance with this permit during its term constitutes compliance for purposes of enforcement with Part C of the Safe Drinking Water Act (SDWA). Such compliance does not constitute a defense to any action brought under Section 1431 of the SDWA, or any other law governing protection of public health or the environment from imminent and substantial endangerment to human health or the environment.

This permit may be modified, revoked and reissued, or terminated during its term for cause. Issuance of this permit does not convey property rights or mineral rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. This permit does not authorize any above ground generating, handling, storage, or treatment facilities.

This permit is based on the application for reissuance submitted in February 1999.

B. PERMIT ACTIONS

1. Modification, Reissuance or Termination

This permit may be modified, revoked and reissued, or terminated for cause as specified in 40 CFR 144.39 and 144.40. Also, the permit can undergo minor modifications for cause as specified in 40 CFR 144.41. The filing of a request for a permit modification, revocation and reissuance, or termination, or the notification of planned changes, or anticipated noncompliance on the part of the permittee does not stay the applicability or enforceability of any permit condition.

2. Transfer of Permits

This permit is not transferable to any person except after notice to the Director on APPLICATION TO TRANSFER PERMIT (EPA Form 7520-7) and in accordance with 40 CFR 144.38. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the SDWA.

C. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

D. CONFIDENTIALITY

In accordance with 40 CFR Part 2, any information submitted to EPA pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed in 40 CFR 2.203 and on the application form or instructions, or, in the case of other submissions, by stamping the words "confidential" or "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 CFR Part 2 (Public Information).

Claims of confidentiality for the following information will be denied:

1. The name and address of the permittee.
2. Information which deals with the existence, absence, or level of contaminants in drinking water.

E. GENERAL DUTIES AND REQUIREMENTS

1. Duty to Comply

The permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application; except that the permittee need not comply with the provisions of this permit to the extent and for the duration such noncompliance is authorized in an emergency permit under 40 CFR 144.34.

2. Penalties for Violations of Permit Conditions

Any person who violates a permit condition is subject to a civil penalty not to exceed \$27,500 per day of such violation. Any person who willfully or negligently violates permit conditions is subject to a fine of not more than \$27,500 per day of violation and/or being imprisoned for not more than three (3) years.

3. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. To be timely, a complete application for a new permit must be received at least 180 days before this permit expires.

4. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

5. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

6. Proper Operation and Maintenance

The permittee shall, at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this permit.

7. Duty to Provide Information

The permittee shall provide to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also provide to the Director, upon request, copies of records required to be kept by this permit.

8. Inspection and Entry

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:

- a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that are kept under the conditions of this permit;
- c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by SDWA, any contaminants or parameters at any location.

9. Records

- a. The permittee shall retain records and all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit and records of all data used to complete this permit application for a period of at least three years from the date of the sample, measurement, report or application. These periods may be extended by request of the Director at any time.
- b. The permittee shall retain records concerning the nature and composition of all injected fluids until three years after the completion of plugging and abandonment. At the conclusion of the retention period, if the Director so requests, the permittee shall deliver the records to the Director. The permittee shall continue to retain the records after the three year retention period unless he delivers the records to the Director or obtains written approval from the Director to discard the records.

- c. Records of monitoring information shall include:
- (1) The date, exact place, and time of sampling or measurements and source and nature of fluids sampled;
 - (2) The name(s) of the individual(s) who performed the sampling or measurements;
 - (3) The date(s) analyses were performed;
 - (4) The name(s) of the individual(s) who performed the analyses;
 - (5) The analytical techniques or methods used; and
 - (6) The results of such analyses.
- d. Monitoring of the nature of injected fluids shall comply with applicable analytical methods cited and described in Table I of 40 CFR 136.3 or in appendix III of 40 CFR Part 261 or in certain circumstances by other methods that have been approved by the Administrator.
- e. All environmental measurements required by the permit, including, but not limited to measurements of pressure, temperature, mechanical integrity, and chemical analyses shall be done in accordance with EPA's Quality Assurance Program Plan.
- f. As part of the COMPLETION REPORT, the operator must submit a PLAN that describes the procedures to be carried out to obtain detailed chemical and physical analysis of representative samples of the waste including the quality assurance procedures used including the following:
- (1) The parameters for which the waste will be analyzed and the rationale for the selection of these parameters;
 - (2) The test methods that will be used to test for these parameters; and
 - (3) The sampling method that will be used to obtain a representative sample of the waste to be analyzed.
- Where applicable, the Waste Analysis Plan (WAP) from the permit application may be incorporated by reference.
- g. The permittee shall complete a written manifest for each load of waste received. The manifest shall contain a description of the nature and composition of all injected fluids, date of receipt, source of material received for disposal, name and address of the waste generator, a description of the monitoring performed and the results, a statement stating if the waste is exempt from regulation as hazardous waste as defined by 40 CFR 261.4, and any information on extraordinary occurrences.

For waste streams piped more or less continuously from the source(s) to the wellhead, the permittee shall provide for continuous, recorded measurement of the discharge volume and shall provide such sampling and testing as may be necessary to provide a description of the nature and composition of all injected fluids, and to support any statements that the

waste is exempt from regulation as hazardous waste as defined by 40 CFR 261.4

- h. Dates of most recent calibration or maintenance of gauges and meters used for monitoring required by this permit shall be noted on the gauge or meter.

10. Reporting Requirements

The permittee shall give notice to the Director, as soon as possible, of any planned physical alterations or additions to the permitted facility or changes in type of injected fluid.

11. Anticipated Noncompliance

The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

12. Twenty-Four Hour Reporting

- a. The permittee shall report to the Director any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. The following shall be included as information which must be reported orally within 24 hours to 206-553-6697:
 - (1) Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water.
 - (2) Any noncompliance with a permit condition or malfunction of the injection system.
- b. A written submission shall also be provided to the address below within five (5) days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact date and times, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue, and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

Manager, Ground Water Protection Unit
U.S. Environmental Protection Agency (OW-137)
1200 Sixth Avenue
Seattle, Washington 98101

13. Other Noncompliance

The permittee shall report all other instances of noncompliance not otherwise reported at the time monitoring reports are submitted. The reports shall contain the information listed in Permit Condition E-12.b.

14. Reporting Corrections

When the permittee becomes aware that he failed to submit any relevant facts in the permit application or submitted incorrect information in a permit application or in any report to the Director, the permittee shall promptly submit such facts or information.

15. Signatory Requirements

a. All permit applications, reports required by this permit and other information requested by the Director shall be signed by a principal executive officer of at least the level of vice-president, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

- (1) The authorization is made in writing by a principal executive of at least the level of vice-president.
- (2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility. A duly authorized representative may thus be either a named individual or any individual occupying a named position.
- (3) The written authorization is submitted to the Director.

b. If an authorization under paragraph a. of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph a. of this section must be submitted to the Director prior to or together with any reports, information or applications to be signed by an authorized representative.

c. Any person signing a document under paragraph a. of this section shall make the following certification:

"I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

F. PLUGGING AND ABANDONMENT

1. Notice of Plugging and Abandonment

The permittee shall notify the Director no later than 45 days before conversion or abandonment of the well.

2. Plugging and Abandonment Report

The permittee shall plug and abandon the well as provided in the PLUGGING AND ABANDONMENT PLAN (Appendix F), which is hereby incorporated as a part of this permit. Within 60 days after plugging any well the permittee shall submit a report to the Director in accordance with 40 CFR 144.51(p). EPA reserves the right to change the manner in which the well will be plugged if the well is not proven to be consistent with EPA requirements for construction and mechanical integrity. The Director may ask the permittee to update the estimated plugging cost periodically.

3. Cessation Limitation

After a cessation of operations of two years, the permittee shall plug and abandon the well in accordance with the plan unless he:

- a. Provides notice to the Director;
- b. Demonstrates that the well will be used in the future; or
- c. Describes actions or procedures, satisfactory to the Director, that the permittee will take to ensure that the well will not endanger underground sources of drinking water during the period of temporary abandonment. These actions and procedures shall include compliance with the technical requirements applicable to active injection wells unless waived by the Director.

4. Cost Estimate for Plugging and Abandonment

- a. The permittee estimates the 1999 cost of plugging and abandonment of the permitted wells to be \$105,000 each
- b. The permittee must submit financial assurance and a revised estimate in April of each year. The estimate shall be made in accord with 40 CFR 144.62.
- c. The permittee must keep at the facility during the operating life of the facility the latest plugging and abandonment cost estimate.
- d. When the cost estimate changes, the documentation submitted under 40 CFR 144.63(f) shall be amended as well to ensure that appropriate financial assurance for plugging and abandonment is maintained continuously.
- e. The permittee must notify the Director by registered mail of the commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming the owner or operator as debtor, within 10 business days after the commencement of the proceeding.

G. FINANCIAL RESPONSIBILITY

The permittee shall maintain continuous compliance with the requirement to maintain financial responsibility and resources to close, plug, and abandon the underground injection well. If the financial test and corporate guarantee provided under 40 CFR 144.63(f) should change, the permittee shall immediately notify the Director. The permittee shall not substitute an alternative demonstration of financial responsibility for that which the Director has approved, unless it has previously submitted evidence of that alternative demonstration to the Director and the Director notifies him that the alternative demonstration of financial responsibility is acceptable.

PART II
WELL SPECIFIC CONDITIONS

A. CONSTRUCTION

All planned wells have been completed in accordance with the original application and the requirements of the prior permit, AK-11003-1. No additional wells are authorized for construction under this permit.

B. CORRECTIVE ACTION

The applicant has identified no wells in the area of review which require corrective action.

C. WELL OPERATION

1. During Injection

The injection facility shall be manned 24 hours per day by trained and qualified operators during injection.

3. Mechanical Integrity

a. Standards

The injection well(s) must have and maintain mechanical integrity pursuant to 40 CFR 146.8.

b. Prohibition Without Demonstration
of Mechanical Integrity

Injection operations are prohibited after the effective date of this permit unless the permittee has conducted the following tests and submitted the results to the Director:

- (1) To detect leaks in the casing, tubing, or packer, the casing-tubing annulus must be pressure tested to at least 1,500 psig for thirty minutes. The pressure shall show a stabilizing tendency. That is, the pressure may not decline more than 10 percent during the test period and shall experience less than one-third of its total loss in the last half of the test period. If the total loss exceeds 5% or if the loss during the second 15 minute period is equal to or greater than one half the loss during the first 15 minutes, the permittee may extend the test period for an additional 30 minutes to demonstrate stabilization. This pressure test is required at a time interval of no more than 12 months between tests.
- (2) To detect movement of fluids behind the casing, approved fluid movement tests shall be conducted not less often than annually. Approvable fluid movement tests include, but are not limited to tracer surveys, temperature, noise or other logs. The specific suite of fluid movement tests proposed to satisfy this requirement are subject to prior approval by the Director. Tracer surveys shall be run at injection pressures at least equal to the maximum continuous injection pressure observed in the well in the previous 6 months and the tracer concentration shall be sufficient to

ensure detection behind the casing. Copies of all logs shall be accompanied by a descriptive and interpretative report. The initial operational fluid movement tests shall be completed not later than August 1, 2000.

c. Terms and Reporting

- (1) Two (2) copies of the log(s) and two (2) copies of a descriptive and interpretive report of the mechanical integrity tests identified in 3.b shall be submitted within 45 days of completion of the logging.
- (2) Mechanical integrity shall also be demonstrated by the pressure test in 3.b.(1) any time the tubing is removed from the well or if a loss of mechanical integrity becomes evident during operation. The permittee shall report the results of such tests within 45 days of completion of the tests.
- (3) The permittee shall notify the Director of intent to demonstrate mechanical integrity at least 30 days prior to subsequent demonstrations. Such notice must include an indication of the suite of fluid movement tests the permittee proposes to use. In the event that any of the proposed tests has not been previously approved by the Director, this notice shall include: (a) a complete description of such proposed tests, (b) available evidence supporting the applicability of the proposed test, and (c) a description of such back-up procedures as the permittee deems necessary to adequately demonstrate mechanical integrity in the event that the proposed tests fail to do so.
- (4) The Director will notify the permittee of the acceptability of the mechanical integrity demonstration within 13 days of receipt of the results of the mechanical integrity tests. Injection operations may continue during this 13 day review period. If the Director does not respond within 13 days, injection may continue.
- (5) In the event that the well fails to demonstrate mechanical integrity during a test or a loss of mechanical integrity occurs during operation, the permittee shall halt operation immediately and shall not resume operation until the Director gives approval to resume injection.
- (6) The Director may, by written notice, require the permittee to demonstrate mechanical integrity at any time.

4. Injection Intervals

Injection shall be limited to the Sagavanirktok Formation through existing perforated intervals.

5. Injection Pressure and Rate Limitations

The maximum injection pressure, measured at the wellhead, shall not exceed 1400 pounds per square inch (psig). The injection rate shall be limited to 285,720 barrels per month based on a 30 day month. Further, injection pressures and rates shall be limited as needed to prevent the initiation of new fractures or propagation of existing fractures in the confining zone. The permittee shall continuously monitor both the injection rate and pressure.

7. Annulus Pressure

The annulus between the tubing and the long string casing shall be filled with a corrosion inhibited non-freezing solution. A positive surface pressure up to 150 psig is authorized.

8. Injection Fluid Limitation

No substance other than those non-hazardous wastes noted in the permit application shall be injected. Neither hazardous waste as defined in 40 CFR 261 nor radioactive waste other than naturally occurring radioactive material (NORM) from pipe scale and sludge shall be injected for disposal.

D. MONITORING

1. Monitoring Requirements

Samples and measurements collected for the purpose of monitoring shall be representative of the monitored activity.

2. Continuous Monitoring Devices

Continuous monitoring devices shall be installed, maintained, and used to monitor injection pressure and rate, and to monitor the pressure of the non-freezing fluid in the annulus between the tubing and the long string casing. Calculated flow rates and calculated volumes are not acceptable.

3. Alarms and Operational Modifications

- a. The permittee shall install, continuously operate, and maintain alarms to detect excess injection pressures and rates and significant changes in annular fluid pressure. These alarms must be of sufficient placement and urgency to alert operators in all operating spaces.
- b. The permittee shall install and maintain an emergency shutdown system to respond to losses of internal mechanical integrity as evidenced by deviations in the annular fluid pressure.
- c. Plans and specifications for the alarms and pressure relief valve shall be submitted to the Director prior to the initiation of injection.

E. REPORTING REQUIREMENTS

1. Quarterly Reports

The permittee shall submit quarterly reports to the Director containing the following information:

- a. Monthly average, maximum and minimum values for injection pressure, rate, and volume shall be reported on INJECTION WELL MONITORING REPORT (EPA Form 7520-8).
- b. Graphical plots of continuous injection pressure and rate monitoring.
- c. Raw monitoring data in an electronic format.
- d. Physical, chemical, and other relevant characteristics of the injected fluid.
- e. Any well work over or other significant maintenance of downhole or injection-related

surface components.

- f. Results of all mechanical integrity tests performed since the previous report including any maintenance-related tests and any "practice" tests.
- g. Any other tests required by the Director.

2. Report Certification

All reporting and notification required by this permit shall be signed and certified in accordance with Part I.E.15., and submitted to the following address:

Manager, Ground Water Protection Unit
U.S. Environmental Protection Agency (OW-137)
1200 Sixth Avenue
Seattle, Washington 98101

APPENDIX
REPORTING FORMS

Enclosed are EPA Forms:

7520-7	APPLICATION TO TRANSFER PERMIT
7520-8	INJECTION WELL MONITORING REPORT
7520-9	COMPLETION FORM FOR INJECTION WELLS